

CLAIMS

What is claimed is:

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1. In a network having a master device and a plurality of slave devices in network communication with said master device, a Medium Access Control layer protocol for transmission and reception of network packets, comprising:

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- a Time Division Multiple Access frame definition having,
  - a start-of-frame section,
  - a command section,
  - a data slot section containing a plurality of variable length slots,
  - a synchronization slot, and
  - 15 a timestamp slot.

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2. The Medium Access Control layer protocol as recited in claim 1, wherein said protocol is configured to implement dynamic requisition of variable-length data slots within said frame.

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3. The Medium Access Control layer protocol as recited in claim 2, wherein said protocol is configured to implement dynamic allocation of said variable-length data slots.

4. The Medium Access Control layer protocol as recited in claim 3, wherein said protocol is configured to implement dynamic reallocation of said variable-length data slots.
- 5 5. The Medium Access Control layer as recited in claim 1, wherein said master device and slave device are further configured to coordinate a scheduled switch from a first set of data slot parameters to second set of data slot parameters.
- 10 6. The Medium Access Control layer protocol as recited in claim 5, wherein said timestamp slot further comprises a bit-field which is incremented by a master timestamp counter.
- 15 7. The Medium Access Control layer protocol as recited in claim 6, wherein each of said slave devices is configured to maintain a local copy of said master timestamp counter.
8. The Medium Access Control layer protocol as recited in claim 1, wherein said variable-length data slots of said frame have a granularity of one bit.
- 20 9. A networking system, comprising:
  - a master device;
  - a plurality of slave devices in network communication with said master device;

a Medium Access Control layer protocol capable of transmission and reception of a plurality of network packets communicated between said master device and said slave devices; and

a Time Division Multiple Access frame definition having,

- 5           a data slot section containing a plurality of variable-length data slots,  
          a synchronization slot, and  
          a timestamp slot.

10           10. The networking system as recited in claim 9 further comprising a bit-field  
          which is configured to be incremented by said master device in a modulo-  
          N manner by a timestamp counter within said timestamp slot.

15           11. The networking system as recited in claim 10, wherein each of said slave  
          devices is configured to provide a local copy of said master timestamp  
          counter which allows slave devices to identify a scheduled frame time.

20           12. The network system as recited in claim 11, wherein each slave device is  
          structured to coordinate a schedule switch from a first set of data slot  
          parameters to a second set of data slot parameters.

13. A networking system as recited in claim 11, wherein said protocol further is  
structured to implement dynamic reallocation of said variable-length data  
slots.

14. A method for scheduling the assignment of variable length data slots in a network system having a master device and a plurality of slave devices in network communication with said master device, comprising;

providing a Time Division Multiple Access frame definition

5 comprising a synchronization slot and a timestamp slot, and a data slot section having a plurality of variable-length data slots; and

determining a schedule time to communicate the assignment and reallocation of said variable-length data slots to each of said slave devices.

10 15. The method of claim 14, further comprising scheduling the assigning and reallocation from a first set of data slot parameters to a second set of data slot parameters with a scheduling frame transmitted at said scheduled time.

15 16. The method of claim 15, further comprising switching the data slot parameters for each participating slave device at said scheduled time.